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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/698,182

10/30/2003

Magnus Karlsson

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10/23/2006

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EXAMINER

BATAILLE, PIERRE MICHE

ART UNIT

PAPER NUMBER

2186

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,182

Applicant(s)

KARLSSON ET AL.

Examiner

Pierre-Michel Bataille

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The present Office Action is taken in response to applicant's communication filed September 1, 2006 responding to Office Rejection dated May 2, 2006. Applicant's amendments and/or arguments have been considered with the results that follow.
2. Claims 1-27 are now pending in the application under prosecution. No new claims have been added

Response to Arguments

3. Applicant's arguments with respect to claims 1 and 25 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by "Do We Need Replica Placement Algorithms In Content Delivery Network?" (Karlsson et al).

With respect to claim 1, Karlsson discloses method of selecting a heuristic class for data placement in a distributed storage system (**replica replacement algorithms, section 2.2**) comprising the steps of:

forming an integer program for each of a plurality of heuristic classes, each of the heuristic classes providing a technique for placing data within the distributed storage system, each of the integer programs comprising an objective of minimizing a replication cost for placing the data (**algorithm that modifies cost function, problem definition specifying cost function; table 2 lists heuristics, techniques for placing data objects in storage nodes**);

solving each of the integer programs which provide the replication cost for each of the heuristic classes (**solving algorithm problem definition consisting of cost function to be minimized**); and

selecting the heuristic class having a low replication cost (**achieve goal is cost function simplification and minimization, thereby selection of lower cost replication**) [Section 2.2, Replica placement Algorithms).

With respect to claim 25, Karlsson discloses computer readable memory comprising computer code for implementing a method of selecting a heuristic class for data placement in a distributed storage system, the method of selecting the heuristic class (**replica replacement algorithms, section 2.2**) comprising the steps of:

forming an integer program for each of a plurality of heuristic classes, each of the heuristic classes providing a technique for placing the data within the distributed storage system each of the integer programs comprising an objective of minimizing a replication cost for placing the data (**algorithm that modifies**

cost function, problem definition specifying cost function; table 2 lists heuristics, techniques for placing data objects in storage nodes);

solving each of the integer programs which provide the replication cost for each of the heuristic classes **(solving algorithm problem definition consisting of cost function to be minimized); and**

selecting the heuristic class having a low replication cost **(achieve goal is cost function simplification and minimization, thereby selection of lower cost replication) [Section 2.2, Replica placement Algorithms).**

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,374,227 (Ye) in view of "Do We Need Replica Placement Algorithms In Content Delivery Network?" (Karlsson et al).

With respect to claims 1, 2, 24, 25, 26 and 27, Ye teaches

- of selecting a heuristic class for data placement in a distributed storage system comprising the steps of: (Abstract, line 1 and 12-14 - State that this optimizes allocation of a resource through the specification of a first heuristic)

Art Unit: 2186

- forming an integer program for each of a plurality of heuristic classes,
(Abstract, lines 4-6 - State that an integer program is received for each of a plurality of bids)
- each of the integer programs comprising an objective of minimizing a replication cost; (Abstract, lines 14-17 - State that the integer program optimizes allocation, which means that replication costs must therefore be minimized)
- solving each of the integer programs (Abstract, lines 6-7 - State that a solution is generated)
- which provide the replication cost for each of the heuristic classes;
(Abstract, lines 17-22 - State that there is a maximization problem)
- selecting the heuristic class having a low replication cost. (Abstract, lines 7-10 - State that there is an optimizer engine that is coupled to the file and solver, so in essence, the heuristic class with a low replication cost is selected)
- solving the specific integer program which provides a specific lower bound for the replication cost; (Column 9, lines 44-49 - Disclose a theoretical lower bound which more closely approximates the optimal solution)
- electing the heuristic class if a difference between the general lower bound and the specific lower bottom is within an allowable amount.

(Column 15, lines 50-64 - State that the first heuristic is applied if there is a valid value between the upper and lower cutoff.

Ye fails to specifically teach each heuristic class providing a technique for placing data within the distributed storage system. However, Karlsson discloses heuristic classes providing a technique for placing data within the distributed storage system, each of the integer programs comprising an objective of minimizing a replication cost for placing the data **(providing algorithms that modify cost function, problem definitions specifying cost function; table 2 lists heuristics, techniques for placing data objects in storage nodes [Section 2.2, Replica placement Algorithms])**. Therefore, it would have been obvious to one having ordinary skill in the art and having both teachings before him/her at the time of the invention, to combine the two systems by providing a technique for placing data within the distributed storage system, as previously known and taught by Karlsson because the result would have provided improved replica algorithm, problem definition simplifying cost function in content delivery networks.

With respect to claims 2-23, the combination of Yee and Karlsson teaches:

forming the general and specific integer programs comprise a system configuration, a workload and a performance requirement ((Col. 6, lines 47-51; Col. 6, line 67 and Col. 7, line 2; Col. 21, lines 29-41);

the performance requirement comprises a bi-modal performance metric. (Col. 21, lines 29-41);

the bi-modal performance metric comprises a criterion and a ratio of successful attempts to total attempts (Col. 21, lines 29-41);

the general integer program comprises general constraints, which model the data placement irrespective of the heuristic class for the data placement (Col. 5, lines 21-26)

the general constraints comprise a performance constraint, which models the performance requirement (Col. 21, lines 56-58)

the specific integer program comprises the general constraints and a specific constraint. (Col. 5, lines 21-26)

the specific constraint comprises a storage constraint (Column 3, lines 36-39).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


US 6240414 (Beizer) Method of resolving data conflicts in a shared data environment of a distributed storage system employing heuristic rules.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre-Michel Bataille whose telephone number is (571) 272-4178. The examiner can normally be reached on Mon-Fri (8:00A to 4:30P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew M. Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2186

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Pierre-Michel Bataille
Primary Examiner
Art Unit 2186

October 15, 2006

PIERRE BATAILLE
PRIMARY EXAMINER